

REMARKS

Claim 9 (now claims 15 and 23) is rejected under 35 U.S.C. § 112, first paragraph, for the reasons noted in the official action. The inadequate written description rejection is acknowledged and respectfully traversed in view of the following remarks. The Applicant notes that the phrase "one of . . ." followed by the relative conjunction "and" between alternatives is commonly used to indicate an alternative without utilizing the word "or" which can be perceived as indefinite. In any event the Applicant is happy to utilize the conjunction "or" if the Examiner requires the same.

The subject matter of claims 8-14, (now claims 15-21 and 22-28, respectively) are rejected, under 35 U.S.C. § 103, as being unpatentable over Alber '082 in view of Waters et al. '596. The Applicant acknowledges and respectfully traverses the raised obviousness rejection in view of the following remarks.

As the Examiner is aware, in order to properly support an obviousness rejection under 35 U.S.C. § 103, the cited references must themselves provide some disclosure, suggestion or teaching which would lead or influence one of ordinary skill in the art to combine the references as suggested by the Examiner. Arguably, Waters et al. '596 relates to an electro-magnetically released radial face friction brake for a computer drive. As set forth in the Background of the Invention - column 1, at least at lines 32-36;

The disc brake construction is particularly advantageous in computer disc applications due to the flexibility of providing large axially directed flux paths, thereby providing a strong brake engaging force over a very short period of time . . . The overall axial dimension of the braking device in computer applications, however, is critical, since it is desirable to design the brake with the minimum axial overall length.

This friction brake for computer disc applications includes a ball and pocket torque booster for producing an increased torque capacity vs. time during a braking action.

However, while the stated aspect of Waters et al. '596 is to limit the axial dimensions of the braking device, the Applicant notes that relative to the Alber '082 reference, this feature of the ball and pocket torque booster actually increases the axial length of the friction brake.

In the torque booster a camming action occurs between the ball element(s) 66 and the relative pocket(s) 62 and 64 which force the magnetic armature member 40 axially away from the housing and into engagement with the friction ring 82. While the camming action, balls 66 and armature 40 provide this torque boost, they also increase the axial length of the Waters et al. '596 brake. Thus, the Applicant notes that if such a friction brake with a torque booster in the related camming notches 62 and 64 and balls 66 were added to the wheel hub as shown in Alber '082 and FIG. 5, it would necessarily increase the axial length of the disclosed wheel hub.

For its part, substantially different from a computer disc drive, Alber '082 relates to a rolling wheel hub for a rolling chair with a foldable chair frame, undoubtedly a motor driven wheelchair as well known in the art. The Applicant notes that FIG. 5 and the related description at column 5, lines 29-46 of Alber '082 arguably disclose an electromagnetic spring force brake integrated into the wheel hub. However, a review of this disclosure does not provide any discussion, suggestion or teaching that such torque boost device and/or relative axial length increase for the electromagnetic spring force brake in a wheelchair application would be advantageous or desirable. In fact, having a torque boost on a wheelchair hub brake might be disadvantageous and even dangerous considering the fact that a person sitting in the wheelchair could potentially be thrown from the wheelchair upon actuation of a torque boost increase in braking action. Therefore, in view of the fact that the references are completely different devices and the significant structural and functional disparities between the combined references does not reveal any motivation to combine the references, the Applicant asserts that one of ordinary skill in the art would not be motivated to combine these references.

Furthermore, the use of a torque boost is probably not even conceivable in such a wheelchair device in view of safety considerations and thus the requirements of the wheel hub for a wheelchair device would teach away from the use of a torque booster device as in Waters et al. '596.

It is well settled law that the references must provide some disclosure, suggestion or teaching that would lead one of ordinary skill to combine the references. Even in cases where all the elements of a claim are found in two different references, the Federal Courts have long held that the references themselves must provide the motivation or suggestion to combine. United Merchants and Manufacturers, Inc. v. Commissioner of Patents, 139 USPQ 199, 200 (DC, District of Columbia 1963). Corporation et al. v. Commissioner of Patents, 141 USPQ 427, 429 (DC, District of Columbia 1964).

Since the Applicant can find no such disclosure in either reference, the Applicant respectfully disagrees with the combination of Alber '082 and Waters et al. '596.

Even if the Alber '082 and Waters et al. '596 references could be combined, and the Applicant adamantly refutes such a combination, the references still fail to disclose several critical aspects of the presently claimed invention, notably that the present invention is a *steerable* wheel hub. In order for the steerable wheel hub, and hence running wheel to rotate for purposes of steering a vehicle, the running wheel needs space, i.e., the steering radius. In a wheel hub drive for a forklift, for example, there is little to no room between the steering radius and the forklift chassis which supports a large battery and must be as compact as possible. If the complete axial length of the transmission, motor and brake are not within the steering radius, then the wheel hub will hit the chassis at some point and limit the steering range of the wheel. Only if the complete axial length of the transmission, motor and brake defining a diameter of an enveloping circle, is maintained within, or substantially equal to the steering radius can such limits on the steering range of the wheel be avoided.

The new claims specifically recite this steerable feature of the present invention. For example, independent claim 15 recites, "A wheel hub drive for a *steerable* running wheel (10) . . .". This is an important feature of the present invention, in particular, because of the stated purpose of the present invention in providing a particularly compact wheel hub assembly. Because the wheel hub drive is for a steerable running wheel, a steering radius of the wheel is, of course, necessary and critical with respect to the axial length of the hub. The steering radius of the wheel is defined in the Applicant's specification at paragraph [007] ". . .the radius of a circle determined during steering by the turning of the running wheel". Accordingly, new claim 15 now recites that, ". . . the steerable running wheel (10) has a steering radius which is substantially the same as a radius of the enveloping circle (9)." Neither of the references, either alone or in combination disclose at least the feature of a steering radius, in fact the fixed nature of the wheelchair hubs teaches away from any such feature of the present invention.

Additionally, it is a critical aspect of the present invention that the axial length of the motor, brake and transmission be contained within the enveloping circle, as also defined in the Applicant's specification, ". . . the enveloping circle is determined by the dimensions of the transmission in combination with the motor and a brake." This is important because as noted in paragraph [008] of the Applicant's specification, "The purpose of the present invention is to indicate a wheel hub drive in which the running wheel is what determines the enveloping circle so that the smallest possible enveloping circle results". Alber '082 cannot have an "enveloping circle" because the wheels are not steerable. In other words, it is important that a radius of the enveloping circle be approximately the same radius as that of the complete wheel itself so that the complete wheel and hub including the transmission, motor and brake being arranged within the enveloping circle which has the same or approximately the same radius as the radius of the steerable running wheel are as compact as possible, i.e., so the transmission, brake and

transmission do not extend outside the steering radius of the wheel. The Applicant's claim 15 now also specifically recites this important feature "wherein . . . the wheel hub drive defines an enveloping circle (9) encompassing the transmission (7), motor (8) and brake (11) and the steerable running wheel (10) has a steering radius *which is substantially the same as a radius of the enveloping circle (9).*"

Again, even if these references could be combined and even if the Alber '082 was a steerable wheel, which it is not, the outer dimensions of the wheel hub 10 is significantly larger than the any enveloping circle as best can be determined by observing FIG. 5 in Alber '082. Without the disclosure of the complete wheel in Alber '082 it is relatively impossible to tell what the steering radius of the wheel might be. In any event, neither of the above discussed references either alone or in combination disclose these features of the presently claimed invention.

Additionally, in view of the above remarks, the Applicant has added a new independent claim 22 which includes the further recitation "wherein a first radius defined by the steerable running wheel (10), and a second radius defined by an enveloping circle around the motor (8), transmission (7) and brake (11) are approximately equal." Again, as such a feature is not disclosed, taught or suggested by the references, the Applicant believes new claim 22 to be allowable as well. Therefore, in view of these above newly rewritten claims and the specific recitations which define the present invention over the cited prior art references either alone or in combination, the Applicant respectfully requests withdrawal of the obviousness rejections under 35 U.S.C. § 103.

The drawings are objected to for the reasons noted in the official action. All of the raised drawing objections are believed to be overcome by the New Replacement Sheets of formal drawings, accompany this Submission. If any further amendment to the drawings is

believed necessary, the Examiner is invited to contact the undersigned representative of the Applicant to discuss the same.

If any further amendment to this application is believed necessary to advance prosecution and place this case in allowable form, the Examiner is courteously solicited to contact the undersigned representative of the Applicant to discuss the same.

In view of the above amendments and remarks, it is respectfully submitted that all of the raised obviousness rejection should be withdrawn at this time. If the Examiner disagrees with the Applicant's view concerning the withdrawal of the outstanding rejection(s) or applicability of the Alber '082 and Waters et al. '596 references, the Applicant respectfully requests the Examiner to indicate the specific passage or passages, or the drawing or drawings, which contain the necessary teaching, suggestion and/or disclosure required by case law. As such teaching, suggestion and/or disclosure is not present in the applied references, the raised rejection should be withdrawn at this time. Alternatively, if the Examiner is relying on his/her expertise in this field, the Applicant respectfully requests the Examiner to enter an affidavit substantiating the Examiner's position so that suitable contradictory evidence can be entered in this case by the Applicant.

In view of the foregoing, it is respectfully submitted that the raised rejection(s) should be withdrawn and this application is now placed in a condition for allowance. Action to that end, in the form of an early Notice of Allowance, is courteously solicited by the Applicant at this time.

The Applicant respectfully requests that any outstanding objection(s) or requirement(s), as to the form of this application, be held in abeyance until allowable subject matter is indicated for this case.

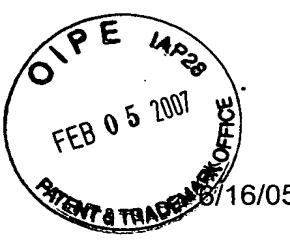
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In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,



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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Frank STÜBNER
Serial no. :
For : WHEEL HUB DRIVE
Docket : ZAHFRI P756US

MAIL STOP PCT

The Commissioner for Patents
U.S. Patent & Trademark Office
P. O. Box 1450
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Dear Sir:

By way of preliminary amendment, please amend the above identified application as set forth below.

In the Drawings:

Please amend Fig. 1 of the drawings presently on file per the attached Submission.

Also enclosed are new formal drawings including the requested amendments.

In the Specification:

Please add paragraphs 002, 003, 005, 010, 014, 016 and 017, delete paragraph 009 and amend paragraphs 004 and 015 of the specification as follows in which the specification additions are shown by underlining and the specification deletions are shown by strikeout. Please enter the replacement specification paragraphs into the record of this case.

In the Claims:

Please cancel claims 1-4, as well as any Chapter II amended claims, without prejudice or disclaimer of the subject matter therein, in favor of new claims 5-11 as follows.

[002] This application is a national stage completion of PCT/EP2003/014289 filed December 16, 2003 which claims priority from German Application Serial No. 102 60 003.1 filed December 20, 2002.

[003] FIELD OF THE INVENTION

[004] The present invention concerns a wheel hub drive according to the preamble of Claim 1.

[005] BACKGROUND OF THE INVENTION

[010] SUMMARY OF THE INVENTION

[014] BRIEF DESCRIPTION OF THE DRAWING

[015] Below, a preferred example embodiment of the invention is described in more detail and illustrated schematically in the attached drawing:

The invention will now be described, by way of example, with reference to the accompanying drawings in which:

[016] Fig. 1 is a web hub drive according to the invention.

[017] DETAILED DESCRIPTION OF THE INVENTION

1-7. (CANCELED)

8. (NEW) A wheel hub drive for a running wheel (10), the wheel hub drive comprising a transmission (7), a motor (8) with a motor shaft (6) and a brake (11) with a stator (1), an armature disk (2) and a rotor (4), the motor (8) being arranged between the brake (11) and the transmission (7), the transmission is made as a planetary transmission and the armature disk (2) is connected by balls (3) to the stator (1) with positive locking so that forces can be transmitted in a radial direction, the rotor (4) being fixed on the motor shaft (6), so that an enveloping circle (9) of the wheel hub drive is determined by the running wheel (10) in such manner that the radius of the enveloping circle is approximately the same as the radius of the running wheel.

9. (NEW) The wheel hub drive for a running wheel (10) according to claim 8, wherein the stator (1) comprises one of a sheet and a sintered component.

10. (NEW) The wheel hub drive for a running wheel (10) according to claim 8, wherein the stator (1) is bolted to a housing cover (12).

11. (NEW) The wheel hub drive for a running wheel (10) according to claim 8, wherein the armature disk (2) comprises a sheet.

12. (NEW) The wheel hub drive for a running wheel (10) according to claim 8, wherein the rotor (4) comprises a sheet.

13. (NEW) The wheel hub drive for a running wheel (10) according to claim 8, wherein the rotor (4) is fixed to the motor shaft (6) by friction.

14. (NEW) The wheel hub drive for a running wheel (10) according to claim 8, wherein the rotor (4) supports a brake lining (5).

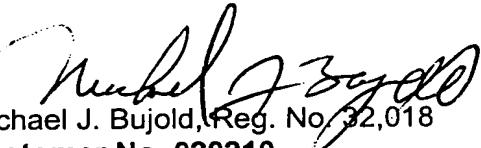
REMARKS

The above newly entered/amended paragraphs of the specification overcome some informalities noted in the specification. The undersigned avers that the newly entered/amended paragraphs of the specification do not contain any new subject matter.

Newly entered claims 8-14 merely rewrite the subject matter of Chapter II amended claims 1-7 in a more traditional U.S. claim format. The entered amendments are not, in any way, directed at distinguishing the present invention from any known prior art. Please consider the newly entered claims upon consideration of this application.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,


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